## **CLAIMS:**

- 1. A method of determining a physical or chemical parameter of wood pulp comprising:
- a) applying excitation light at at least one predetermined wavelength to wood pulp, to produce fluorescence emission light from individual fibre particles of said pulp,
- b) detecting fluorescence intensity of said fluorescence emission light, for each said predetermined wavelength, and
- c) determining a physical or chemical parameter of individual fibre particles of the wood pulp from said fluorescence intensities.
- 2. A method according to claim 1 wherein at least a single wavelength of excitation light in the range 5  $\eta$ m to 700  $\eta$ m is applied in step a) and a physical parameter is determined in step c).
- 3. A method according to claim 2 wherein said excitation light has a wavelength of 250  $\eta m$  to 600  $\eta m$ .
- 4. A method according to claim 3 wherein said wavelength is 360  $\eta m$  to 500  $\eta m$ .
- 5. A method according to claim 1 wherein step c) comprises determining fibre thickness in said wood pulp from the detected fluorescence intensity in b).
- 6. A method according to claim 1 wherein step c) comprises determining fibre cross-sectional area in said wood pulp from area under a

fluorescence intensity profile derived from the detected fluorescence intensity in b).

- 7. A method according to claim 1 wherein said step c) comprises determining fibre coarseness in said wood pulp from the detected fluorescence intensity per unit length in step b).
- 8. A method according to claim 1 wherein step a) comprises applying excitation light at at least one predetermined wavelength band, and step c) comprises determining a chemical parameter of individual fibre particles of the wood pulp from a ratio of fluorescence intensities detected in step b).
- 9. A method according to claim 8 wherein said chemical parameter is lignin content.
- 10. A method according to claim 8 wherein said chemical parameter is Kappa number.
- 11. A method according to claim 8 wherein said ratio is of fluorescence intensity generated from long versus short wavelength barrier / longpass / bandpass filter, or said ratio is derived from long versus short wavelength intensities in the fluorescence spectra.
- 12. An apparatus for determining a physical or chemical parameter of wood pulp comprising:
- i) means to apply excitation light at at least one predetermined wavelength to wood pulp, to produce fluorescence emission light from individual fibre particles of the wood pulp,

- ii) detection means for detecting fluorescence intensity of the fluorescence emission light for each predetermined wavelength, and
- iii) means for determining a physical or chemical parameter of individual fibre particles of the wood pulp from the fluorescence intensities.
- 13. An apparatus according to claim 12 wherein said means i) applies excitation light at at least a single wavelength in the range  $5\eta$  to  $700 \eta m$ , and means ii) determines a physical parameter of individual fibre particles of the wood pulp.
- 14. An apparatus according to claim 13 wherein said wavelength is  $250 \, \eta m$  to  $600 \, \eta m$ .
- 15. An apparatus according to claim 13 wherein said wavelength is  $360 \, \eta m$  to  $500 \, \eta m$ .
- An apparatus according to claim 12 wherein said detection means iii) comprises long and short wavelength filters and means for developing a ratio of the fluorescence intensities generated by the long and short wavelength filters, or by the intensities at long and short wavelength regions in the fluorescence spectra, as a measure of lignin content or Kappa number.